

Blue Orchard Bees and Other New Pollinators for Agriculture

Life is turning out to be a bowl of cherries—actually, bushels and bushels of the sweet, plump fruit—for orchardist Chet Kendell in North Ogden, Utah. Last year, while fellow sweet-cherry growers were reeling from the financial blow of low yields, Kendell was reaping an impressive harvest.

His secret? Blue orchard bees—likely the world's best pollinators for cherry orchards and several other crops as well. Under an agreement with the ARS Bee Biology and Systematics Laboratory in Logan, Utah, Kendell is learning how to capitalize on the pollinating skills of this native insect, known to scientists as *Osmia lignaria*.

Named for their iridescent-blue bodies, blue orchard bees live in every part of the United States. Though blue orchard bees are already being sold commercially for pollination, the familiar *Apis mellifera* honey bee, used here since the 1600s, is still America's dominant commercial pollinator.

For the Logan scientists—situated appropriately in the nation's Beehive State—the collaboration is one of their largest tests of the blue orchard bee's pollinating savvy in a commercial orchard.

The Kendell project is one part of a newly expanded effort to move research results out of the lab and into fields and orchards. The outreach efforts—including three new cooperative research and development agreements—have garnered the team a regional award for excellence in technology transfer from the Federal Laboratory Consortium.

The Logan scientists' emphasis on technology transfer could not have come at a better time. By using the pollination services offered by the blue orchard bee, growers and beekeepers might be able to offset the losses of *A. mellifera* honey

bees that have been felled by disease or parasites or edged out by competition from invasive Africanized honey bees.

For more than 20 years, the Logan laboratory has been the premier source of new information on how to turn wild blue orchard bees into easily managed, commercially viable pollinators. The newest and best of that knowledge is being distilled into a new handbook—now in draft stage—on how to rear this productive pollinator.

Meanwhile, collaborations like the one with orchardist Kendell give scientists and growers alike the opportunity to challenge the bees' skills.

Other team projects may similarly make it simpler, faster, and easier for beekeepers and growers to routinely enlist native bees for pollination. The new cooperative research and development agreement between ARS and International Pollination Systems, Inc., of Caldwell, Idaho, for instance, aims to streamline use of the friendly blue orchard bee as an almond pollinator.

Earlier experiments have already shown that it takes only about 400 nesting females of this species to pollinate an acre of almonds. That same job requires two and one-half to three hives of honey bees, each housing thousands of foraging bees.

Blue orchard bees normally emerge from overwintering in March or April—too late to pollinate almond trees' February blooms. Now, in cooperation with International Pollination Systems, the scientists are trying to nudge the bees out of dormancy a few months ahead of their natural schedule.

To do that, the researchers are using a trick that has worked perfectly in laboratory tests. At a key stage in insect development, they change the temperature at which bees are incubated, hoodwinking them into emerging 2 months earlier than usual—and just in time to visit the pollen-laden almond flowers. New tests will reveal whether International Pollination Systems and other

producers of bees can use that approach successfully in their businesses.

In other work, the Logan researchers are tackling some not unexpected problems that have occurred in management of alfalfa leafcutting bees (*Megachile rotundata*). This research includes developing new tactics to protect these peppy bees from chalk-brood disease. Currently, American beekeepers have essentially been forced to look to Canadian sources for uninfected stock. Other experiments focus on reducing death rates of bee eggs and wormlike larvae.

The story on page 4 in this issue of *Agricultural Research* tells more about the Logan lab's outstanding work. These studies and others are designed with the help of growers and beekeepers who give us suggestions and keep us informed of their concerns and priorities.

We welcome this ongoing exchange.

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